ABSTRACT

Evaluation of Nutritional Value and Antioxidant Property of Selected Wild Edible Fruits of Assam

Wild edible fruits are nutritionally rich and good sources of bioactive compounds especially antioxidant compounds. Regular intake of fruits is widely recommended in human diet as they are the rich sources of nutrients and important phytochemical constituents which on consumption contribute several health benefits against various diseases.

The objective of this investigation was to determine the nutritional contents, phytochemical constituents, antioxidant activity, antimicrobial activity, amino acid composition and anti-nutritional contents of five wild edible fruits *viz*. *Grewia sapida, Antidesma bunius, Eugenia operculata, Aporosa dioica* and *Ottelia alismoides* from Assam, North East India. In this study, antioxidant activities in methanolic extracts of fruits were evaluated using DPPH (1, 1-diphenyl-2-picrylhydrazyl), ABTS (2, 2′-Azinobis (3-ethylbenothiazoline-6-sulfonic acid) diammonium salt), H_2O_2 (Hydrogen peroxide) and FRAP (Ferric reducing antioxidant power) assays. The antimicrobial activities of methanolic extracts were investigated against four bacterial species (two gram-negative and two gram-positive bacteria) using agar disc diffusion method.

The thesis has been divided into seven Chapters. In Chapter I, importance of wild edible fruits as sources of nutrients, anti-nutritional factors, potential sources of bioactive compounds with antioxidant and antimicrobial properties and review on the existing literatures have been presented.

In Chapter II, wild edible fruits selected for this study along with the results of proximate composition determined by following the standard AOAC (2000) methods and other standard procedures are reported and discussed.

Table II.1: Wild edible fruits selected for the study

Botanical name (Family)	Local name (*Bodo)*	Parts used, Test	Availability	Uses
Grewia sapida Roxb. ex DC. (Malvaceae)	Kusra pitai	Whole fruit, Sour and slight sweet	March-May	Fruits are eaten raw when ripe
Eugenia operculata Roxb. (Myrtaceae)	Khorjam	Whole fruit, sweet-sour	June-August	Fruits are eaten raw when ripe
Aporosa dioica (Roxb.) Muell.-Arg. (Euphorbiaceae)	Bergao pitai	Whole fruit, sweet-sour	April-July	Fruits are eaten raw when ripe
Antidesma bunius (L.) Spreng. (Euphorbiaceae)	Pagli tenga	Whole fruit, sweet-sour	June-August	Fruits are eaten raw when ripe
Ottelia alismoides (L.) Pers. (Hydrocharitaceae)	Khar	Whole fruit, Slightly salty	September-December	Fruits are eaten raw when ripe

In Chapter III, the results of macro- and micro-elements present in the wild edible fruits determined using Atomic Absorption Spectrometer (AAS-ICE 3500, Thermo Scientific, UK) are reported in the thesis (**Table III.1** and **III.2**) and discussed.

Table II.2: Proximate composition of wild edible fruits per 100 g of DW

Plants	Moisture (g)	Ash (g)	Crude fat (g)	Crude fibre (g)	Crude protein (g)	Carbohy-drate (g)	Calorific value (kcal)
G. sapida	16.25±0.02^{a} 81.06±0.75*	0.29±0.03^{a}	2.50±0.26^{a}	1.71±0.03^{a}	0.78±0.02^{a}	80.18±0.02^{a}	346.34±0.04^{a}
E. operculata	3.343±0.04^{b} 52.530±0.41*	0.343±0.04^{a}	1.86±0.02^{b}	17.566±0.35^{b}	1.323±0.04^{b}	93.123±0.08^{b}	394.586±0.03^{b}
A. dioica	13.323±0.04^{c} 80.066±3.55*	0.362±0.04^{a}	2.633±0.25^{a}	28.460±0.71^{c}	1.153±0.03^{b}	82.572±0.28^{c}	358.422±1.11^{c}
A. bunius	4.530±0.35^{d} 64.466±0.25*	0.516±0.03^{a}	0.970±0.03^{c}	9.433±0.31^{d}	1.231±0.05^{b,c}	92.743±0.42^{d}	384.651±1.29^{d}
O. alismoides	4.170±0.02^{d} 90.930±1.48*	0.284±0.04^{a}	1.266±0.21^{c}	17.501±0.31^{b}	0.856±0.04^{a,c}	93.418±0.22^{b}	388.501±1.12^{e}

**, Moisture content of fresh fruit; DW, dry weight; Values were expressed as mean of three replicates ± standard deviation; The data with different letters in a column are significantly different from each other at $p < 0.05$.*

Table III.1: Macro-element analysis of wild fruits (mg/100 g DW)

Plants	Na	K	Ca	Mg
G. sapida	3.873±0.02^{a}	1243.788±8.71^{a}	472.555±0.94^{a}	122.004±0.24^{a}
E. operculata	4.640±0.05^{b}	2219.736±6.66^{b}	714.820±8.58^{b}	172.387±0.52^{b}
A. dioica	3.297±0.04^{a}	1555.960±15.56^{c}	337.850±1.69^{c}	73.771±0.29*c*
A. bunius	5.377±0.03^{c}	3043.852±6.09^{d}	787.900±14.18^{d}	250.703±0.25^{d}
O. alismoides	162.50±1.13^{d}	2776.150±28.89^{e}	206.021±7.69^{e}	252.830±2.81^{e}

Values were expressed as mean of 3 replicates ± standard deviation; DW, Dry weight; The data with different letters in a column are significantly different from each other at p < 0.05.

Table III.2: Micro-element analysis of wild fruits (mg/100 g DW)

Plants	Fe	Cu	Zn	Mn	Co
G. sapida	7.574±0.02^{a}	0.905±0.05^{a}	1.318±0.04^{a}	3.208±0.03^{a}	0.299±0.02^{a}
E. operculata	8.279±0.03^{b}	1.493±0.05^{b}	1.828±0.01^{b}	2.817±0.02^{a}	0.352±0.05^{a}
A. dioica	6.649±0.03^{c}	0.637±0.05^{a}	0.926±0.02^{a}	5.008±0.05^{b}	0.261±0.02^{a}
A. bunius	7.579±0.02^{a}	1.774±0.06^{b}	2.903±0.01^{c}	7.616±0.02^{c}	0.390±0.02^{a}
O. alismoides	28.960±0.11^{d}	5.510±0.10^{c}	2.780±0.04^{c}	13.020±0.20^{d}	0.490±0.05^{a}

Values were expressed as mean of 3 replicates ± standard deviation; DW, Dry weight; The data with different letters in a column are significantly different from each other at p < 0.05.

In Chapter IV of the thesis, phytochemical compounds are qualitatively investigated using five different solvent extracts *viz*. methanol, acetone, aqueous, hexane and chloroform extracts of fruits. The total phenolic, flavonoid and vitamin C contents of the wild fruits are estimated quantitatively employing standard methods. A significant variation in the phenolic, flavonoid and vitamin C contents has been observed and reported. The antioxidant activities in the methanolic extracts of the fruits are also evaluated by employing established *in vitro* systems which included DPPH (1, 1-diphenyl-2-picrylhydrazyl), ABTS (2, 2′-Azinobis (3-ethylbenothiazoline-6-sulfonic acid) diammonium salt), H_2O_2 (Hydrogen peroxide) and FRAP (Ferric reducing antioxidant power) assays. The results of Chapter IV are presented in **Tables IV.6, IV.7, IV.8, IV.9** and **IV.10.**

Table IV.6 :DPPH free radical scavenging activity of methanolic extract of wild fruits

Fruit extract/ Standard	Concentration (µg/mL) and its inhibition (%)								IC_{50}
	2	5	10	50	100	200	400	500	
G. sapida	6.733± 0.27[a]	13.966± 0.75[a]	16.566± 0.37[a]	21.246± 0.43	26.166± 0.25[a]	35.833± 0.41[a]	75.466± 0.45[a]	85.433± 0.25[a]	257.666± 2.52[a]
E. operculata	17.973± 0.64[b]	22.496± 0.96[b]	25.636± 0.82[b]	61.960± 0.18	80.551± 1.02[b]	83.421± 0.37[b]	85.012± 0.64[b]	89.651± 0.55[b]	92.330± 4.16[b]
A. dioica	16.110± 0.46[c]	18.340± 0.37[c]	20.050± 0.73[c]	37.053± 0.41	48.070± 0.46[c]	78.230± 0.46[c]	83.236± 0.36[c]	87.481± 0.46[c]	168.001± 2.65[c]
A. bunius	17.481± 0.32[b]	18.903± 0.47[d]	19.381± 0.16[d]	22.936± 0.55	29.373± 0.64[d]	31.403± 0.47[d]	48.441± 0.36[d]	61.413± 0.39[d]	395.002± 3.61[d]
O. alismoides	16.636± 0.52[c]	19.643± 0.27[e]	22.383± 0.15[e]	26.786± 0.52	32.433± 0.28[e]	44.220± 0.47[e]	51.496± 0.36[e]	58.513± 0.71[e]	364.33± 5.51[e]
Ascorbic acid	15.80± 0.56[d]	27.10± 0.75[f]	36.433± 0.71[f]	93.233± 0.41	93.60± 0.50[f]	94.166± 0.55[f]	94.333± 0.65[f]	95.066± 0.45[f]	16.666± 2.51[f]

IC_{50} value in µg/mL; Values were expressed as mean of 3 replicates ± standard deviation; The data with different letters in a column are significantly different from each other at $p < 0.05$.

Table IV.7: ABTS radical scavenging activity of methanolic extract of wild fruits

Fruit extract/ Standard	Concentration (µg/mL) and its inhibition (%)						IC_{50}
	20	50	75	100	150	250	
G. sapida	29.69±0.58^{a}	32.50±0.65^{a}	42.866±0.51^{a}	46.72±1.39^{a}	55.89±1.05^{a}	66.95±0.29^{a}	134.33±4.05^{a}
E. operculata	28.93±0.35^{b}	41.006±0.46^{b}	66.033±0.51^{b}	78.69±0.73^{b}	81.613±0.45^{b}	90.170±0.65^{b}	52.660±1.15^{b}
A. dioica	32.220±0.29^{c}	52.113±0.51^{c}	71.380±0.72^{c}	80.196±0.86^{c}	85.883±0.73^{c}	91.901±1.02^{c}	27.333±1.52^{c}
A. bunius	24.771±0.75^{d}	36.912±1.19^{d}	46.363±0.52^{d}	52.483±1.06^{d}	63.726±0.29^{d}	80.743±0.89^{d}	105.331±3.06^{d}
O. alismoides	13.070±1.23^{e}	23.430±1.38^{e}	31.586±1.08^{e}	33.686±0.86^{e}	41.690±0.46^{e}	57.380±0.62^{e}	201.00±6.55^{e}
Ascorbic acid	36.093±0.87^{f}	38.520±1.17^{f}	55.550±1.03^{f}	66.856±0.66^{f}	73.506±0.81^{f}	79.426±1.16^{f}	73.666±3.21^{f}

IC_{50} value in µg/mL; Values were expressed as mean of 3 replicates ± standard deviation; The data with different letters in a column are significantly different from each other at $p < 0.05$.

Table IV. 8: Hydrogen peroxide scavenging activity of methanolic extract of wild fruits

Fruit extract/ Standard	Concentration (µg/mL) and its inhibition (%)					IC_{50}
	5	10	15	20	25	
G. sapida	16.03±0.18^{a}	32.366±0.26^{a}	45.206±0.38^{a}	59.583±0.29^{a}	65.46±0.36^{a}	17.66±0.25^{a}
E. operculata	13.24±0.09^{b}	27.631±0.65^{b}	36.073±0.31^{b}	47.566±0.12^{b}	62.196±0.25^{b}	20.566±0.21^{b}
A. dioica	19.286±0.15^{c}	37.653±0.32^{c}	40.126±0.11^{c}	61.046±0.14^{c}	68.256±0.28^{c}	16.566±0.25^{c}
A. bunius	5.936±0.15^{d}	18.006±0.23^{d}	27.203±0.16^{d}	32.473±0.11^{d}	55.013±0.07^{d}	24.366±0.06^{d}
O. alismoides	5.256±0.31^{e}	13.500±0.24^{e}	24.040±0.18^{e}	37.450±0.19^{e}	52.410±0.14^{e}	24.466±0.12^{d}
Ascorbic acid	10.410±0.31^{f}	27.890±0.16^{b}	41.940±0.24^{f}	51.451±0.12^{f}	60.523±0.28^{f}	19.766±0.15^{e}

IC_{50} value in µg/mL; Values were expressed as mean of 3 replicates ± standard deviation; The data with different letters in a column are significantly different from each other at $p < 0.05$.

Table IV.9: FRAP value, TPC, TFC and Vitamin C content of wild fruits

Plants	FRAP value (µM TE/g dried extract)	Total phenolic content (mg GAE/g dry extract)	Total flavonoid content (mg QE/g dry extract)	Vitamin C (mg/100 g fresh fruit)
G. sapida	62.40 ± 10.40^{a}	294.353 ± 4.69^{a}	116.95 ± 10.71^{a}	8.60 ± 0.30^{a}
E. operculata	281.583 ± 8.79^{b}	226.741 ± 2.10^{b}	108.761 ± 7.02^{b}	6.60 ± 1.12^{b}
A. dioica	106.583 ± 5.20^{c}	146.710 ± 2.81^{c}	72.510 ± 8.83^{c}	6.12 ± 0.61^{b}
A. bunius	61.583 ± 3.82^{d}	119.356 ± 1.39^{d}	64.323 ± 8.82^{d}	7.30 ± 1.45^{c}
O. alismoides	44.083 ± 7.64^{e}	93.860 ± 1.17^{e}	43.270 ± 5.36^{e}	3.68 ± 0.84^{d}

Values were expressed as mean of 3 replicates ± standard deviation; The data with different letters in a column are significantly different from each other at $p < 0.05$.

The Pearson's correlation coefficients among the results of antioxidant activities (DPPH, ABTS, H_2O_2, FRAP), TPC, TFC and vitamin C content of five wild edible fruits are also presented in **Table IV.10** of Chapter IV and discussed.

Table IV.10: Pearson's correlation coefficients of antioxidant activities (DPPH, ABTS, H_2O_2, FRAP), TPC, TFC and vitamin C content in the wild fruits

	DPPH	ABTS	H_2O_2	FRAP	TPC	TFC	Vitamin C
DPPH	1						
ABTS	0.737	1					
H_2O_2	0.690	0.597	1				
FRAP	-0.831	-0.612	-0.202	1			
TPC	-0.526	-0.212	-0.627	0.349	1		
TFC	-0.639	-0.396	-0.618	0.525	0.971^{a}	1	
Vitamin C	-0.187	-0.371	-0.469	0.093	0.752	0.777	1

a, Correlation is significant at $p<0.01$ (2-tailed).

In Chapter V of the thesis, the antimicrobial activities in the methanolic extracts of five wild edible fruits were tested against four microbial strains *viz. Staphylococcus*

aureus MTCC-7443, *Bacillus cereus* MTCC-430, *Escherichia coli* MTCC-40 and *Proteus vulgaris* MTCC-7299 by employing the disk diffusion method. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of fruit extracts against four microbial strains have also been examined and reported. The results which are reported and discussed in the thesis are displayed in **Tables V.1, V.2, V.3** and **V.4.**

Table V.1: Antibacterial activity of methanol extracts of fruits against *B. cereus*

Sample	Zone of inhibition at different concentration (mm)				MIC (mg/mL)	MBC (mg/mL)
	10 mg/mL	20 mg/mL	30 mg/mL	Amoxicillin (30 µg/mL)		
G. sapida	0	9.5±2.78^{a}	11±2.64^{a}	23±2.64^{a}	15	<30
A. bunius	0	0	13.6±2.08^{b}	28.3±2.51^{b}	<30	<30
E. operculata	7.3±1.52^{a}	9.6±2.08^{a}	13.3±4.04^{b}	23.6±1.52^{c}	7.5	15
A. dioica	0	10.3±3.21^{b}	13.6±1.52^{b}	27.3±2.08^{d}	15	<30
O. alismoides	0	0	10.6±2.3^{a}	26.6±3.05^{e}	<30	<30

<30 = Concentration is below 30 mg/mL; Values were expressed as mean of three replicates ± standard deviation; The data with different letters in a column are significantly different from each other at p < 0.05.

Table V.2: Antibacterial activity of methanol extracts of fruits against *S. aureus*

Sample	Zone of inhibition at different concentration (mm)				MIC (mg/mL)	MBC (mg/mL)
	10 mg/mL	20 mg/mL	30 mg/mL	Amoxicillin (30 µg/mL)		
G. sapida	0	9.6±3.46^{a}	11.3±0.57^{a}	25.6±2.08^{a}	15	<30
A. bunius	0	9±2.64^{b}	14±2.64^{b}	26±2.64^{a}	15	<30
E. operculata	9.3±2.51^{a}	10.6±1.15^{c}	14.3±2.51^{b}	28.3±3.21^{b}	7.5	15
A. dioica	9.5±3.04^{a}	12.3±2.51^{d}	14.6±3.21^{b}	23.3±2.51^{c}	7.5	15
O. alismoides	9.6±2.08^{a}	10±1.73^{a}	12.6±1.15^{c}	29.6±2.08^{d}	7.5	15

<30 = Concentration is below 30 mg/mL; Values were expressed as mean of three replicates ± standard deviation; The data with different letters in a column are significantly different from each other at p < 0.05.

Table V.3: Antibacterial activity of methanol extracts of fruits against *E. coli*

Sample	Zone of inhibition at different concentration (mm)				MIC (mg/mL)	MBC (mg/mL)
	10 mg/mL	20 mg/mL	30 mg/mL	Amoxicillin (30 µg/mL)		
G. sapida	0	12.3±1.15^{a}	14.3±2.51^{a}	30.3±2.51^{a}	15	15
A. bunius	0	0	15.6±2.08^{b}	27.6±2.88^{b}	<30	<30
E. operculata	0	0	12.3±3.51^{c}	28.3±0.57^{c}	<30	<30
A. dioica	0	8.3±3.21^{b}	13±2.64^{d}	26.6±2.08^{d}	15	<30
O. alismoides	8.3±1.52^{a}	12.6±4.04^{a}	16.6±4.04^{e}	29±3.60^{e}	7.5	15

<30 = Concentration is below 30 mg/mL; Values were expressed as mean of three replicates ± standard deviation; The data with different letters in a column are significantly different from each other at p < 0.05.

Table V.4: Antibacterial activity of methanol extracts of fruits against *P. vulgaris*

Sample	Zone of inhibition at different concentration (mm)				MIC (mg/mL)	MBC (mg/mL)
	10 mg/mL	20 mg/mL	30 mg/mL	Amoxicillin (30 µg/mL)		
G. sapida	0	14±1.73^{a}	16.6±1.15^{a}	28±4.58^{a}	15	15
A. bunius	0	8.3±1.52^{b}	13.3±0.57^{b}	24±1.73^{b}	15	<30
E. operculata	0	0	13±3.60^{b}	25.3±3.21^{c}	<30	<30
A. dioica	0	12.3±2.08^{c}	14±1.73^{c}	28.6±0.57^{d}	15	15
O. alismoides	0	0	9.3±2.51^{d}	22±2.64^{e}	<30	<30

<30 = Concentration is below 30 mg/mL; Values were expressed as mean of three replicates ± standard deviation; The data with different letters in a column are significantly different from each other at p < 0.05.

In Chapter VI, identification and quantification of amino acids with the help of reversed-phase HPLC (Agilent 1200 series) are reported. Amino acid profiles and chemical scores of the five wild edible fruits reported in the thesis are presented in **Table VI.2** and **Table VI.3,** respectively.

Table VI.2: Amino acid profiles of five wild edible fruits in % of total amino acids

Amino acids	***G. sapida*** **(% of TAA)**	***O. alismoides*** **(% of TAA)**	***A. dioica*** **(% of TAA)**	***A. bunius*** **(% of TAA)**	***E. operculata*** **(% of TAA)**
Aspartic acid	1.593	1.151	2.276	3.837	3.075
Serine	nd	0.496	0.425	1.105	1.892
Glutamic acid	2.283	4.467	9.667	6.544	3.151
Proline	nd	nd	0.745	nd	nd
Glycine	nd	2.685	1.867	0.978	nd
Alanine	2.564	nd	0.838	nd	1.096
Cysteine	1.814	nd	7.306	17.049	nd
Tyrosine	nd	1.249	3.336	nd	3.094
Arginine	1.423	2.388	1.671	0.904	7.187
Total NEAA	9.677	12.436	28.131	30.417	19.495
EAA					
Threonine	4.602	1.234	nd	nd	1.339
Valine	0.142	0.265	0.214	1.029	0.273
Methionine	0.391	0.249	0.426	nd	nd
Isoleucine	4.434	4.459	nd	nd	nd
Leucine	6.538	19.665	19.431	4.438	1.849
Phenylalanine	nd	nd	3.305	2.701	nd
Lysine	nd	2.592	nd	nd	nd
Histidine	12.986	5.916	0.467	2.702	0.819
Total EAA	29.093	34.38	23.843	10.87	4.28
Total (NEAA + EAA)	38.770	46.816	51.974	41.287	23.775

TAA, Total Amino Acids; NEAA, Non-Essential Amino Acids; EAA, Essential Amino Acids; nd, not detected.

Table VI.3: Amino acid score of five wild edible fruits based on FAO/WHO/UNU (2007) consultation pattern

Amino acids	FAO/WHO/ UNU (2007) (mg/g protein)	Chemical score (%)				
		G. sapida	*O. alismoides*	*A. dioica*	*A. bunius*	*E. operculata*
Valine	39	3.642	6.795	5.488	26.385	7.0
Lysine	45	--	57.60	--	--	--
Isoleucine	30	147.8	148.634	--	--	--
Leucine	59	110.814	333.306	329.339	75.221	31.339
Phenylalanine + Tyrosine	38	--	--	174.763	71.079	--
Threonine	23	200.087	53.653	--	--	58.218
Histidine	15	865.734	394.40	31.134	180.134	54.6
Methionine	16	24.438	15.563	26.626	--	--
Total EAA	277	105.029	124.116	86.076	39.242	15.452

EAA, Essential Amino Acids.

In Chapter VII, some anti-nutritional compounds such as oxalate, tannin, phytate, saponin and alkaloid are evaluated using standard methods and the results (**Table VII.1)** are reported and discussed in the thesis.

Table VII.1: Anti-nutritional parameters of wild fruits in mg/g dried sample

Plants	**Oxalate**	**Tannin**	**Phytate**	**Saponin**	**Alkaloid**
G. sapida	6.825 ± 0.34^{a}	0.345 ± 0.03^{a}	4.730 ± 0.01^{a}	0.093 ± 0.02^{a}	0.69 ± 0.07^{a}
E. operculata	4.147 ± 0.38^{b}	0.175 ± 0.03^{a}	5.313 ± 0.02^{b}	0.063 ± 0.03^{a}	0.56 ± 0.02^{a}
A. dioica	6.247 ± 0.96^{a}	0.904 ± 0.03^{b}	7.153 ± 0.01^{c}	0.126 ± 0.02^{b}	1.34 ± 0.02^{b}
A. bunius	3.15 ± 0.45^{c}	$0.678\pm0.02^{a,b,c}$	3.799 ± 0.02^{d}	0.073 ± 0.02^{a}	0.31 ± 0.06^{a}
O. alismoides	8.932 ± 0.93^{d}	$1.031\pm0.01^{b,c}$	5.525 ± 0.01^{b}	0.166 ± 0.03^{b}	1.68 ± 0.02^{b}

Values were expressed as mean of three replicates ± standard deviation; The data with different letters in a column are significantly different from each other at $p < 0.05$.

Conclusions

In this study, appreciable amounts of proximate composition have been observed to meet the recommended dietary allowances. The calorific value of *E. operculata* fruits (394.58 ± 0.03 kcal/100 g) was found to be the highest among the five wild fruits. Wild edible fruits investigated were found as the good sources of major minerals like Na, K, Ca and Mg, and essential trace elements such as Fe, Cu and Zn. *A. bunius* fruit showed the highest content of K and Ca whereas *O. alismoides* fruit exhibited the highest content of Fe, Mn, Co, Cu, Na and Mg. The fruit extracts revealed the presence of important bioactive compounds which are considered to have potential therapeutic effects. The investigation revealed that the wild fruits are good sources of natural antioxidants as their extracts exhibited high antioxidant activities. *G. sapida* fruit exhibited the highest total phenolic and flavonoid contents which were 294.35 ± 4.69 mg GAE/g dry extract and 116.95 ± 10.71 mg QE/g dry extract, respectively. The antimicrobial activities of the fruit extracts were studied and found to be potentially effective against the tested bacterial strains. Amino acid analysis revealed the presence of eight essential amino acids and nine non-essential amino acids. The study shows that these fruits are good sources of both essential amino acids and non-essential amino acids and could be recommended as a nutritional supplement. In this study, the fruit of *O. alismoides* exhibited higher levels of anti-nutritional factors such as oxalate, tannin, saponin and alkaloid. The lower levels of oxalate, phytate and alkaloid contents were observed in the fruit of *A. bunius*. All the five wild edible fruits contained anti-nutritional factors at varied concentrations and very high levels of anti-nutritional compounds were not observed. Hence, consumption of these fruits may be encouraged.